

**“That’s what they taught you.  
Let me tell you what really happens”**

**Creating safety culture  
from the streets to the hospital**

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Because “we can know more than we can tell”.  
(Michael Polanyi, 1962)

# Error in Medicine

- Medical errors contribute to increased:
  - Mortality and morbidity
  - Human suffering
- Can culture change save us?
- Safety culture
  - Fewer than expected accidents
- The High Reliability Organization
  - Fewer than expected accidents
  - Despite a high risk environment
- The translation of culture
  - Successes in healthcare
  - Lost in translation?

# Safety Culture in Healthcare

- Identify underlying problem area, construct solutions to target specific problems (AHRQ)
- Patient Safety Incidents
  - Wrong site surgery
  - Medication errors
  - Health care-associated infections
  - Falls
  - Readmissions
  - Diagnostic errors
  - Never events (unambiguous, serious, usually preventable)
    - Pressure sores
    - Falls
    - Retained objects (surgery)

# Solutions

- “Internal” solutions (more targeted)
  - Evidence-based medicine
  - Best practices
  - Clinical pathways
  - Protocols
  - Rapid Response Teams
  - Executive walk arounds

# Solutions

- External solutions (more generalized)
  - Aviation – CRM, check lists, human factors engineering, simulation exercises (limited evidence for safety culture)
  - Military – command and control, vertical hierarchy, situational awareness, team work (Team STEPPS, Team Strategies and Tools to Enhance Performance and Patient Safety)
  - Nuclear power
  - Engineering – resilience engineering, systems, design
  - Industry – root cause analysis, six sigma, Lean
  - *Entertainment industry*

# Gains but no change

“Despite strong face validity for a variety of patient safety culture strategies, there is limited evidence to support definitive impacts on patient safety climate outcomes.” (British Medical Journal)

- Healthcare has made gains in specific areas
- Overall, healthcare has not changed
- Expanded definition of patient safety
  - Disruptive behavior
  - Diagnostic errors

# What Happened to Culture?

- Social response to the environment
  - Social knowledge passed from elder to novice
- Behaviors, beliefs, specific structure
  - Behaviors – direct effects (*quid pro quo*) vs. indirect effects (adaptive)
  - Beliefs – imposed (resistance, resentment) vs. internalized (passion)
  - Structure – designed (engineered) vs. self-organized (emergent)
- Environment is left out of discussion



# Safe from what?

- Safety culture originally based on accident rates
  - Routine operations in a safe environment
  - Unusual operations in a hazardous environment?
- Safety culture from engineering fields
  - Technology and human control of energy (socio-technical interactions)
- Accident or harm from uncontrolled energy
  - Accidents are more clearly demarcated
  - Responses commonly linear

# Safe from what?

- Medical accidents and harm
  - Biology and control of physiology and behavior
  - Accidents may not be accident (cardiac catheterization, septic shock, and death. Child had no spleen to fight bacteria, discovered on autopsy)
  - Complex and nonlinear interactions between physiology, pathology, underlying health, behavioral responses, etc.)
- Patient safety
  - *Written by people with limited experience in hazardous environments*
  - *Safety culture: a culture with low accident rate or a culture that works with hazards?*

# The environment *is* the pathology

- Emotion
- Epistemology
  - Knowledge domains (cognitive vs. affective)
- Reasoning
- Attitudes and Values
- The anomaly (outlier)

# Threat: Sources of security

- Structure
  - Authority
    - Off site
  - Rules
    - Discrete and static Self-protection through offensive (blame), defensive actions
- Engagement
  - Interactive real-time risk assessment and management (Bob Bea)
  - Learn structure of problem and threat
  - Learn what works through action
  - Self-protection through (intellectual) strength

# Emotion

- Prefrontal cortex – thinking center
  - Perception to thought
  - Executive functions of brain
    - Future thinking
    - Binary decision-making
- Amygdala – threat response
  - Perception to action
  - Environmental influence on thought
  - Self-protection
  - Adrenaline and cortisol
  - Fight, flight, and freeze
    - Anger, avoidance, confusion and freeze

# Epistemology

Convert belief to knowledge when we encounter the novel or complex

- Empirical and evidence-based vs. Anecdotal
- Reasoning
  - Deductive – facts guarantee the hypothesis
  - Inductive – *evidence* supports our *conclusion*
- Knowledge domains
  - Cognitive – facts, principles, and theories
  - Affective – How will this help? Attitudes
    - “Let me tell you how it really works”

# Attitudes and Values

- **Attitudes** (modified from Weick and Sutcliffe, *Managing the Unexpected*)
  - Engagement (sensitivity to operations)
  - Perseverance (resilience)
  - Early heralds of failure (preoccupation with failure)
  - Others (deference to expertise)
    - Local knowledge
    - Experience
    - Help comes from others
    - Team by shared objective
  - Perception (reluctance to simplify)
    - Limits to what we can see or understand
    - Things change

# Attitudes and Values

- Attitudes for operational safety and reliability
  - Duty, not as tasks
  - Honesty, cf. trust
  - Dignity, cf. respect
  - Empathy, to learn from misfortune
  - Humility, to serve others
- Value shifts necessary for dynamic situations
  - Conformity vs. Creativity
  - Obedience vs. Initiative



# The anomaly (outlier)

- Random, independent event
  - Statistics and probability
  - Normal distribution
  - Linear, mechanistic
  - Tendency to disregard distant outlier

# The anomaly (outlier)

- Processes
  - Covert, compensated state to overt, decompensated state
  - Entrainment and cascading failure
  - Possibility
  - Power distribution (Pareto Distribution)
  - Nonlinear, complex
    - Nonlinear interaction of simple principles creates novel, unexpected properties
  - Second nature to monitor for *early heralds of dysfunction*

# Safety Culture

- Enables operations within a hazardous environment
- Conditions members to monitor and engage early heralds of dysfunction
- Complexity of actions and organization expand in real time matching the complexity of the problem
- Acknowledgment and modulation of threat response
- Specific epistemology, reasoning, decision making and
- An emergent phenomenon of specific behaviors, beliefs/attitudes/values, and structure

The anomaly is not a random, independent event we easily disregard;

The anomaly is the early herald, a warning, we investigate through engagement.

Thank you